

Application No. 10/001,741

**REMARKS**

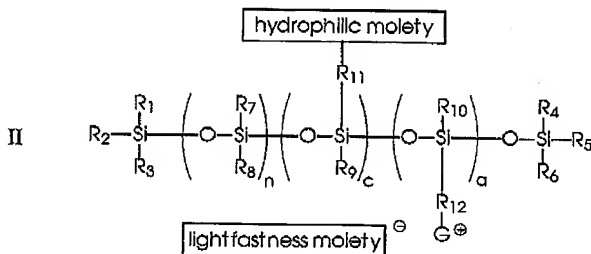
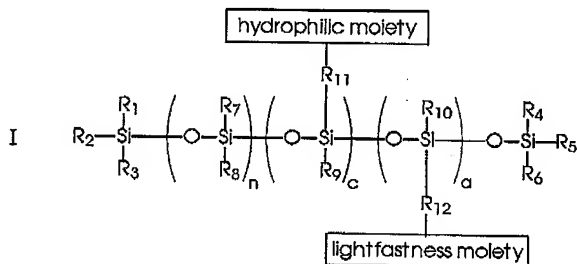
Claims 1 to 21 are pending in the application. The disclosure has been objected to for informalities. Claims 1 to 3, 14 to 16, and 18 to 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Marritt (U.S. Patent 6,231,655) or Nyssen et al. (U.S. Patent 6,245,138) either in view of Maycock et al. (U.S. Patent 4,859,759) and Pearlstine et al. (U.S. Patent 6,087,416). Claims 1, 14 to 16, and 18 to 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Marritt or Nyssen et al. either in view of Meuwly et al. (U.S. Patent 5,837,792) and Pearlstine et al. Claims 4 to 13 and 17 have been objected to as being dependent upon a rejected base claim, and have been indicated to be allowable if rewritten in independent form.

With respect to the objection to the disclosure for informalities, the Examiner has stated that it is preferred that application numbers be used in place of attorney docket numbers on pages 1 and 3. Applicants have amended these paragraphs as requested by the Examiner, thereby eliminating any possible basis for this ground for objection.

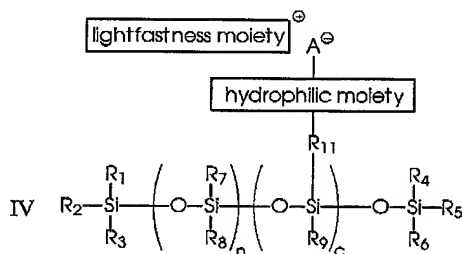
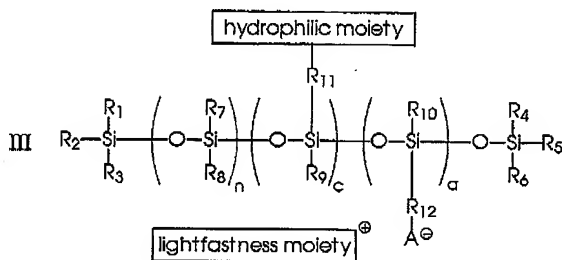
Applicants have rewritten claim 4 in independent form. Applicants have also added new claim 22, which recites formulae II through V, and have amended claims 5, 6, 8 to 13, and 17 to depend therefrom. Applicants believe that these amendments place these claims in condition for allowance. New claims 23 to 29, which also depend from new claim 22, are also believed to be in condition for allowance.

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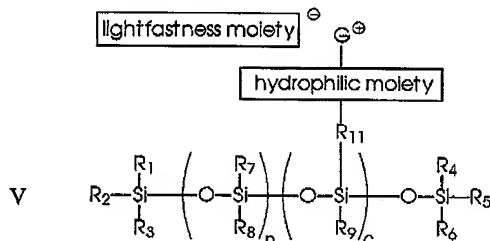
Applicants respectfully traverse the rejections of claims 1 to 3, 14 to 16, and 18 to 21 under §103. The present invention is directed to an ink composition which comprises water, a colorant, and a lightfastness agent of one of the formulae



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or



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wherein  $R_1$ ,  $R_2$ ,  $R_3$ ,  $R_4$ ,  $R_5$ ,  $R_6$ ,  $R_7$ ,  $R_8$ ,  $R_9$ , and  $R_{10}$  each, independently of the others, is an alkyl group, an aryl group, an arylalkyl group, or an alkylaryl group,  $R_{11}$  and  $R_{12}$  each, independently of the others, is an alkylene group, an arylene group, an arylalkylene group, or an alkylarylene group,  $\oplus$  is a cationic moiety,  $\ominus$  is an anionic moiety,  $n$  is an integer representing the number of repeat  $-\text{OSi}(R_7)(R_8)-$  monomer units,  $a$  is an integer representing the number of repeat  $-\text{OSi}(R_{10})(R_{12}\text{-lightfastness moiety})-$  monomer units, and  $c$  is an integer representing the number of repeat  $-\text{OSi}(R_9)(R_{11}\text{-hydrophilic moiety})-$  monomer units. Advantages of the present invention (or at least some embodiments thereof) can include enhanced lightfastness of images generated with the inks, close association of the lightfastness agent with the colorant in the ink, and other advantages as set forth in the specification and illustrated in the examples.

The Examiner has rejected claims 1 to 3, 14 to 16, and 18 to 21 under §103 as being unpatentable over Marritt or Nyssen et al. either in view of Maycock et al. or Pearlstine et al.

Marritt discloses an ink composition including water as the principal solvent, a pigment dispersion or dye, and a polyoxyalkylenated polyfluoro-isopropylidene glycerol compound. The composition may be formed by using a pigment dispersion having a pigment and a pigment dispersant. The pigment dispersant may be a derivative of a polyuronic acid in which a hydrophobic polymer is covalently attached to the reducing terminus of the polyuronic acid. The polyuronic acid may be composed primarily of 1,4-linked

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polygalacturonic acid, polyguluronic acid, polyiduronic acid, or mixed polymers thereof.

Nyssen et al. discloses an aqueous pigment preparation containing an ionic alkoxylated styrene-phenol condensate or a mixture thereof with a hydroxy-terminated alkoxylated styrene-phenol condensate.

Maycock et al. discloses a siloxane which contains at least one benzotriazolyl/tetraalkylpiperidyl group, which siloxane can be represented by the general formula S-Z in which S represents a siloxane moiety and Z represents a pendant benzotriazolyl/tetraalkylpiperidyl group attached by means of a divalent connecting group to a silicon atom. The compounds are useful as additives for the preparation of surface-segregatable, melt-extrudable thermoplastic compositions. The compositions, in turn, are useful for the preparation of fibers and films by melt extrusion, which fibers and films have enhanced stability to degradation by actinic radiation.

Pearlstone et al. discloses an ink jet ink composition and process for printing on vinyl substrates in which the ink comprises an aqueous vehicle containing at least water and a water-miscible glycol or glycol ether, wherein water constitutes no more than 80 percent by weight based on the total weight of the vehicle; an insoluble colorant (preferably a pigment); a polymeric dispersant; a silicon or fluorinated surfactant; and, optionally but preferably, a graft copolymer binder having a hydrophobic backbone and nonionic, hydrophilic side chains, which binder is soluble in the aqueous vehicle but insoluble in water.

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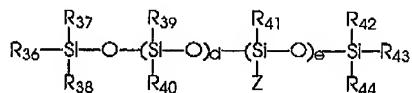
The Examiner has stated that Marritt discloses an ink jet ink comprising water, colorant, and UV light absorbing agent, that the reference also discloses a process of using the ink wherein the ink is incorporated into a piezoelectric or thermal ink jet printer and then ejecting the ink onto a substrate, and that although there is no explicit disclosure of the amount of UV light absorbing agent utilized, it would have been within the skill level of one of ordinary skill in the art to choose the amount of UV light absorbing agent, including that presently claimed, which would protect the ink from light.

The Examiner has also stated that Nyssen et al. discloses an ink jet ink comprising water, colorant, and light stabilizer, that the reference also discloses a process of using the ink wherein the ink is incorporated into a piezoelectric or thermal ink jet printer and then ejecting the ink onto a substrate, and that although there is no explicit disclosure of the amount of light stabilizer utilized, it would have been within the skill level of one of ordinary skill in the art to choose the amount of light stabilizer, including that presently claimed, which would protect the ink from light.

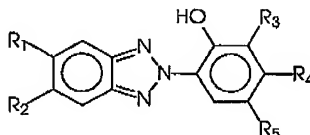
The Examiner has stated that the difference between Marritt and Nyssen et al. and the present claimed invention is the requirement in the claims of a specific type of light absorbing or stabilizing agent.

The Examiner has stated that Maycock et al. discloses the use of siloxane that contains at least one benzotriazolyl group of the formula

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wherein Z is

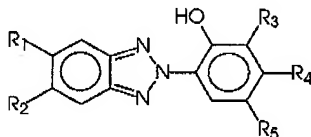


wherein  $R_{36}$  to  $R_{44}$  are hydrogen, alkyl, or aryl and  $R_1$  to  $R_5$  are each hydrogen, that the motivation for using such siloxane is as an ultraviolet radiation absorbing agent, that the above siloxane is identical to that presently claimed when  $n$ ,  $c$ , and  $a$  are each 1 and  $d$  and  $e$  of Maycock et al. as set forth in the above formula are 2 and 1, respectively, with the exception that there is no hydrophilic moiety present as presently claimed, but that it is well known, as found in Pearlstine et al., to attach hydrophilic groups such as polyoxyalkylene groups to polysiloxanes to control the degree of compatibility as well as polarity of the additive. The Examiner is of the position that in light of the disclosure of ultraviolet absorbing agent disclosed by Maycock et al. as well as the motivation for attaching hydrophilic groups to the ultraviolet absorbing agent disclosed by Pearlstine et al., it would have been obvious to one of ordinary skill in the art to use such ultraviolet absorbing agent in the ink of either Marritt or Nyssen et al. to protect the ink from damage from UV radiation, thereby arriving at the claimed invention.

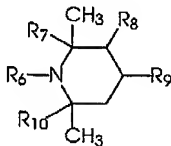
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Applicants disagree with this position. Marritt states, at column 14, lines 34 to 46, that the inks disclosed therein may also contain other additives such as pH buffers, biocides, viscosity modifiers, ultraviolet ray absorbers, and antioxidants. Nyssen et al. states, at column 9, lines 54 to 56 and 61, that the pigment preparations disclosed therein can also contain preservatives, light stabilizers, further surfactants, and pH regulators, and that examples of light stabilizers are UV absorbers. The Examiner has not pointed to anything in either of these references that teaches or suggests any specific lightfastness agents.

Maycock et al. is directed to a siloxane which contains at least one substituent containing both a benzotriazolyl component and a tetraalkylpiperidyl component. The benzotriazolyl moiety is represented by the formula



and the tetraalkylpiperidyl moiety is represented by the formula



The siloxane is disclosed to be useful as an additive to thermoplastic polymers. As the Examiner has stated, the siloxane disclosed in this



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reference has no hydrophilic moiety present. The Examiner has pointed to nothing in this reference that would teach or suggest that the siloxane disclosed therein would be suitable for use in an aqueous ink composition.

Pearlstone et al. is directed to an aqueous ink suitable for ink jet printing onto vinyl substrates. Waterfastness and lightfastness are achieved by selecting as the colorant a pigment or insoluble dye, since pigments are known to be more lightfast and waterfast than dyes soluble in aqueous inks. The ink also contains a silicon surfactant or fluorinated surfactant; the silicon surfactant can be a block copolymer of dialkylsiloxane having pendant from some of the silicon atoms a polyoxyalkylene chain instead of an alkyl group. The surfactant is used to wet the surface of the substrate. The Examiner has not pointed to anything in this reference that would teach or suggest that the surfactant would be useful for purposes of increasing lightfastness; rather, the reference teaches that lightfastness can be achieved by using pigment colorants.

The Examiner appears to have considered various portions of the references cited, in each instance viewing the cited portion in isolation from the context of the entire reference, and combined these isolated portions to arrive at the present invention with the benefit of hindsight. Using hindsight or applying the benefit of the teachings of the present application when determining obviousness, however, is impermissible; the references applied must be reviewed without hindsight, must be reviewed as a whole, and must suggest the desirability of combining the references. Lindemann Maschinenfabrik v.

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American Holst & Derrick Co., 221 U.S.P.Q. 481 (Fed. Cir. 1984). None of the cited references suggests or teaches the desirability of combining the elements of the present invention as claimed. Obviousness cannot be established by combining references to arrive at the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. In re Geiger, 2 U.S.P.Q. 2d 1276 (Fed. Cir. 1987); Carella v. Starlight Archery and Pro Line Co., 804 F.2d 135, 231 U.S.P.Q. 644 (Fed. Cir. 1986); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. (BNA) 929 (Fed. Cir. 1984). When determining patentability under §103, the Examiner must consider the invention as a whole, and cannot view each element of the claim separately with respect to the prior art. See, e.g., Jones v. Hardy, \_\_\_ F.2d \_\_\_, 220 U.S.P.Q. 1021 (BNA) (Fed. Cir. 1984). When prior art references require selective combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself. Uniroyal Inc. v. Rudkin Wiley Corp., \_\_\_ F.2d \_\_\_, 5 U.S.P.Q. 2d 1435 (Fed. Cir. 1988); Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 227 U.S.P.Q. 543 (Fed. Cir. 1985). It is impermissible to use the claims as a frame and the prior art references as a mosaic to piece together a facsimile of the claimed invention. Uniroyal Inc. v. Rudkin Wiley Corp., \_\_\_ F.2d \_\_\_, 5 U.S.P.Q. 2d 1435 (Fed. Cir. 1988); W. L. Gore and Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983).

In essence, the Examiner has taken the siloxane molecule of Maycock et al., eliminated the required tetraalkylpiperidine component, added a polyoxyalkylene group from the surfactant disclosed in Pearlstine et al., and taken the resulting molecule and

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added it to the inks of Marritt or Nyssen et al. The Examiner is using Applicants' disclosure as a recipe for selecting the appropriate portions of the prior art to construct Applicants' lightfastness-imparting agent and ink composition. A piecemeal reconstruction of the prior art patents in light of Applicants' disclosure is not a basis for a holding of obviousness. In re Kamm et al., 172 U.S.P.Q. 298 (C.C.P.A. 1972). The mere fact that the prior art molecules and inks could have been modified does not make the modification obvious unless the prior art suggested the desirability of such a modification. See, e.g., In re Gordon, 221 U.S.P.Q. 1125, (Fed. Cir. 1984); Jones v. Hardy, 220 U.S.P.Q. 1021, (Fed. Cir. 1984). It is clear that the combination of patents does not suggest that the modifications proposed by the Examiner be made. Accordingly, Applicants are of the position that the present invention as recited in claims 1 to 3, 14 to 16, and 18 to 21 is patentable with respect to the cited references.

Applicants also direct the Examiner's attention to new claims 30 and 31. These claims recite inks wherein the siloxane compound has a lightfastness moiety which is a hydroxybenzophenone group, a hydroxybenzoic acid group, an alkoxybenzoic acid group, an ester of a substituted benzoic acid, a (hydroxyphenyl)-1,3,5-triazine group, a phenylbenzimidazole sulfonic acid group, or a reducing sugar group. Applicants believe that these claims are particularly in condition for allowance.

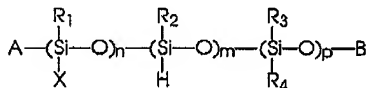
Applicants further direct the Examiner's attention to new claims 32 and 33. These claims recite inks wherein the siloxane compound has a hydrophilic moiety which is a poly(2-alkyloxazoline) or

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a poly(ethyleneimine) chain. Applicants believe that these claims are particularly in condition for allowance.

The Examiner has also rejected claims 1, 14 to 16, and 18 to 21 under §103 as being unpatentable over Marritt or Nyssen et al. either in view of Meuwly et al. and Pearlstine et al.

Meuwly et al. discloses oligomeric or polymeric siloxanes of the formula



if X is a monovalent radical, or which are correspondingly crosslinked, if X is a polyvalent radical, whose repeating units are arranged randomly or in blocks, which contain hydroxy-phenyl-diaryl-s-triazine moieties, are useful as stabilizers for organic material against damage thereto by light, oxygen, and heat; and especially as stabilizers for coating materials.

The Examiner has stated that Marritt discloses an ink jet ink comprising water, colorant, and UV light absorbing agent, that the reference also discloses a process of using the ink wherein the ink is incorporated into a piezoelectric or thermal ink jet printer and then ejecting the ink onto a substrate, and that although there is no explicit disclosure of the amount of UV light absorbing agent utilized, it would have been within the skill level of one of ordinary skill in the art to choose the amount of UV light absorbing agent, including that presently claimed, which would protect the ink from light.

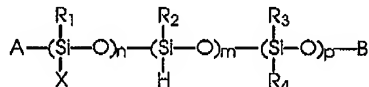
The Examiner has also stated that Nyssen et al. discloses an ink jet ink comprising water, colorant, and light stabilizer, that the

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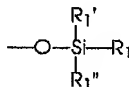
reference also discloses a process of using the ink wherein the ink is incorporated into a piezoelectric or thermal ink jet printer and then ejecting the ink onto a substrate, and that although there is no explicit disclosure of the amount of light stabilizer utilized, it would have been within the skill level of one of ordinary skill in the art to choose the amount of light stabilizer, including that presently claimed, which would protect the ink from light.

The Examiner has stated that the difference between Marritt and Nyssen et al. and the present claimed invention is the requirement in the claims of a specific type of light absorbing or stabilizing agent.

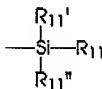
The Examiner has stated that Meuwly et al. discloses a light stabilizer of the formula



wherein A is



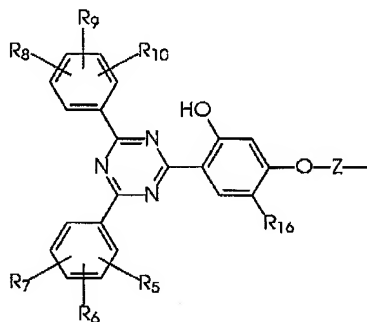
B is



X is a lightfastness moiety of the formula

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and  $R_1$  to  $R_4$ ,  $R_1$ ,  $R_1$ ,  $R_1$ ,  $R_{11}$ ,  $R_{11}$ , and  $R_{11}$  are each  $C_1$  to  $C_{18}$  alkyl, that the motivation for using such light stabilizer is to stabilize against damage by light, oxygen, and heat, that there is no disclosure of a hydrophilic moiety present as presently claimed, but that it is well known, as found in Pearlstine et al., to attach hydrophilic groups such as polyoxyalkylene groups to polysiloxanes to control the degree of compatibility as well as polarity of the additive. The Examiner is of the position that in light of the motivation for using specific light stabilizer disclosed by Meuwly et al. as well as the motivation for attaching hydrophilic groups to the ultraviolet absorbing agent disclosed by Pearlstine et al., it would have been obvious to one of ordinary skill in the art to use such light stabilizer in the ink of either Marritt or Nyssen et al. to protect the ink from damage, thereby arriving at the claimed invention.

Applicants disagree with this position. Marritt states, at column 14, lines 34 to 46, that the inks disclosed therein may also contain other additives such as pH buffers, biocides, viscosity modifiers, ultraviolet

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ray absorbers, and antioxidants. Nyssen et al. states, at column 9, lines 54 to 56 and 61, that the pigment preparations disclosed therein can also contain preservatives, light stabilizers, further surfactants, and pH regulators, and that examples of light stabilizers are UV absorbers. The Examiner has not pointed to anything in either of these references that teaches or suggests any specific lightfastness agents.

Meuwly et al. is directed to oligomeric or polymeric siloxanes which contain hydroxy-phenyl-diaryl-s-triazine moieties. The siloxanes are suitable for light stabilization of organic materials, organic polymers in particular, such as coatings. As the Examiner has stated, the siloxane disclosed in this reference has no hydrophilic moiety present. The Examiner has pointed to nothing in this reference that would teach or suggest that the siloxane disclosed therein would be suitable for use in an aqueous ink composition.

Pearlstone et al. is directed to an aqueous ink suitable for ink jet printing onto vinyl substrates. Waterfastness and lightfastness are achieved by selecting as the colorant a pigment or insoluble dye, since pigments are known to be more lightfast and waterfast than dyes soluble in aqueous inks. The ink also contains a silicon surfactant or fluorinated surfactant; the silicon surfactant can be a block copolymer of dialkylsiloxane having pendant from some of the silicon atoms a polyoxyalkylene chain instead of an alkyl group. The surfactant is used to wet the surface of the substrate. The Examiner has not pointed to anything in this reference that would teach or suggest that the surfactant would be useful for purposes of increasing lightfastness; rather, the

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reference teaches that lightfastness can be achieved by using pigment colorants.

The Examiner appears to have considered various portions of the references cited, in each instance viewing the cited portion in isolation from the context of the entire reference, and combined these isolated portions to arrive at the present invention with the benefit of hindsight. Using hindsight or applying the benefit of the teachings of the present application when determining obviousness, however, is impermissible; the references applied must be reviewed without hindsight, must be reviewed as a whole, and must suggest the desirability of combining the references. Lindemann Maschinenfabrik v. American Hoist & Derrick Co., 221 U.S.P.Q. 481 (Fed. Cir. 1984). None of the cited references suggests or teaches the desirability of combining the elements of the present invention as claimed. Obviousness cannot be established by combining references to arrive at the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. In re Geiger, 2 U.S.P.Q. 2d 1276 (Fed. Cir. 1987); Carella v. Starlight Archery and Pro Line Co., 804 F.2d 135, 231 U.S.P.Q. 644 (Fed. Cir. 1986); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. (BNA) 929 (Fed. Cir. 1984). When determining patentability under §103, the Examiner must consider the invention as a whole, and cannot view each element of the claim separately with respect to the prior art. See, e.g., Jones v. Hardy, \_\_\_ F.2d \_\_\_, 220 U.S.P.Q. 1021 (BNA) (Fed. Cir. 1984). When prior art references require selective combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention



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Applicants also direct the Examiner's attention to new claims 32 and 33. These claims recite links wherein the siloxane compound has a hydrophilic moiety which is a poly(2-alkyloxazoline) or a poly(ethylenimine) chain. Applicants believe that these claims are particularly in condition for allowance.

Applicants believe that the foregoing amendments and distinctions place the claims in condition for allowance, and accordingly respectfully request reconsideration and withdrawal of all grounds for rejection.

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In the event the Examiner considers personal contact advantageous to the disposition of this case, she is hereby authorized to call Applicant(s) attorney, Judith L. Byorick, at Telephone Number (585) 423-4564, Rochester, New York.

Respectfully submitted,

  
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